# DSP Strategy for Supporting and Promoting Joint and International Interoperability

## Interoperability and Logistics Readiness IPT

September 2001

# Contents

# Introduction

The Defense Standardization Program issued its Strategic Plan in October 1999 to address the management and leadership challenges in the 21st Century. The plan addresses six major focus areas: Interoperability; Logistics Readiness; Total Ownership Cost; Leadership and Management; Infrastructure; and Processes, Products, and Services. Each major focus area has an associated goal with specific objectives, actions, steps, and milestones. DLA and each Service took responsibility for developing implementation approaches for selected areas within the plan.

## INTEROPERABILITY AND LOGISTICS READINESS IPT TASKING

This concept paper addresses and combines Interoperability and Logistics Readiness IPT tasks I.A.1, I.A.2, I.B.1, I.C.1, I.C.2, and I.C.3 under the interoperability goal.

| Interoperability Goal | | |
|---|---|---|
| The DSP supports joint and international progress toward full interoperability through commonality of systems, components, and architectures; improved processes and communications for cooperation in standardization; and aggressive efforts to identify additional standardization opportunities. | | |
| **Objective I.A** | | |
| The DSP has coordinated cooperation among the operational, acquisition, and logistics communities, and integrated processes with those communities to lay the foundation for achieving interoperability through commonality of systems, components, and architecture. | | |
| **Action I.A.1** | **Key Steps** | **Lead** |
| Provide a source for commonality information and guidance | 1. Identify and collect information exchange system requirements for linking operational, acquisition, and logistics commonality needs <br><br> 2. Design and implement a commonality forum on the information exchange system <br><br> 3. Monitor the use of commonality information exchange process | Navy |

| Action I.A.2 | Key Steps | Lead |
|---|---|---|
| Propose revisions to requirements, acquisition, and sustainment processes to incorporate interfaces with the DSP | 1. Identify policies and procedures related to requirements, acquisition, and sustainment processes<br>2. Outline general processes<br>3. Identify interface gaps<br>4. Establish an IPT to rework interface gaps<br>5. Propose revisions to existing policy | Navy |

| **Objective I.B** |
|---|
| The DSP has in place processes and communications that enhance cooperation among participants in joint and international standardization efforts. |

| Action I.B.1 | Key Steps | Lead |
|---|---|---|
| Provide a source for interoperability information and guidance | 1. Identify and collect information exchange system requirements for joint and international interoperability needs<br>2. Design and implement an interoperability forum on the information exchange system<br>3. Monitor the use of interoperability information exchange process | Navy |

| **Objective I.C** |
|---|
| The DSP has institutionalized standardization best practices and a proactive process to identify additional standardization opportunities |

| Action I.C.1 | Key Steps | Lead |
|---|---|---|
| Develop a process for identifying best practices for promoting standardization opportunities that enhance interoperability | 1. Establish an IPT to develop a plan and process<br>2. Identify best standardization practices being used<br>3. Provide training and facilitate implementation of best practices<br>4. Develop a strategy to convince appropriate programs and users to participate in the DSP and use its products and practices<br>5. Initiate outreach efforts | Navy |

| Action I.C.2 | Key Steps | Lead |
|---|---|---|
| Determine the standardization needs of the CINCs, MAJCOMs, and functional areas | 1. Conduct a CINC/MAJCOM awareness program<br>2. Conduct survey to determine needs based on JV 2010 | Navy |

| Action I.C.3 | Key Steps | Lead |
|---|---|---|
| Develop and implement requirements, planning, and decision processes (RPD) to be used by standardization management activities and defense organizations | 1. Review those RPD processes currently being used for standardization processes<br>2. Recommend policy revisions | Navy |

# PROBLEM DEFINITION

When the Cold War ended, the Department of Defense began a major reevaluation of military requirements, strategies, and operations. Several key documents describe the resulting revolution in military affairs. Among these documents, Joint Vision 2010 and Joint Vision 2020 define a challenge and provide a roadmap for defense in the 21st Century. The required future capabilities include seamless joint and coalition operations, more effective logistics support, and lower total ownership cost.

Joint and international interoperability are crucial elements in realizing these visions. While interoperability has increased steadily, progress is slow, sporadic, and relatively uncoordinated. The primary focus of interoperability efforts have been on information architecture and operational doctrine. The entire spectrum of materiel interoperability has received little consideration.

Several high level Defense Department leaders recently have characterized current interoperability capabilities and progress as unsatisfactory. There are small communities of practice in interoperability, but they remain fairly isolated and insular. Forums on interoperability are rare. No roadmap exists to guide interested parties to the experts, practitioners, and best practices for interoperability. In addition, incentives for programs to pursue interoperability are weak and frequently outweighed by cost, schedule, and performance pressures.

# NEED AND OPPORTUNITY

Standardization is fundamental to achieving interoperability. Achieving interoperability, by definition, requires open communication, shared decisionmaking, negotiation and compromise regarding requirements, choice of common rather than unique solutions, and selection of items to satisfy shared requirements. Unfortunately, standardization is not a priority for most programs; some programs even consider standardization as counter to their interests.

Defense leaders must actively promote interoperability and provide incentives, motivation, and resources to achieve interoperability. Advocacy and incentives alone are insufficient to achieve significant interoperability improvement. Practitioners need a comprehensive knowledge-management resource for interoperability and standardization information. Effective forums are essential to create meaningful interoperability networks across domains and mission areas. Users need a complete, accurate roadmap to guide them through the complex interoperability community.

## OBJECTIVES AND DESIRED OUTCOMES

The objective of this strategy is to create new, effective resources that will promote increased interoperability. Among the desired outcomes are a Web-enabled knowledge-management portal for interoperability, effective forums for interoperability dialogue and decisionmaking, and an interoperability roadmap to guide users through the interoperability maze. Collectively these capabilities will assist in developing a more mature interoperability community. The capabilities will integrate interoperability and standardization resources and clearly illustrate their essential relationship; standardization enables interoperability.

# Recommendations

## RECOMMENDATION #1

The Defense Standardization Program Office (DSPO) should implement and maintain a comprehensive customer interoperability database. The database should be used within the knowledge-management portal as a directory to the interoperability community. In addition, the database should be used as a tool to help manage the Defense Standardization Program (DSP)-customer relationship with the interoperability community.

## RECOMMENDATION #2

The DSPO should develop an accurate and complete roadmap of the interoperability community and make it available through the knowledge-management portal.

## RECOMMENDATION #3

Because the roadmap provides a valuable service to the interoperability community, DSPO should seek sponsorship or partnerships from key interoperability organizations to share the costs or resources required to operate and maintain the service.

## RECOMMENDATION #4

The DSPO, working with key DoD leaders and interoperability offices, should advocate and promote the creation of interoperability networks.

# Concept of Overview

The core idea contained in this concept paper is simple—create a complete, robust knowledge-management resource for the interoperability community. The DSPO should design it as part of the DSP portal and link it to the DSP portal's standardization knowledge-management capability as seamlessly as possible.

While the core idea is simple, making the idea a reality is complex. The complexity lies in several areas. First, the concept of an interoperability community is new. Today, there really is no definable interoperability community per se. This section attempts to partially define the community. Second, interoperability itself is still an unclear term. The IPT found that many individuals who have "interoperability" responsibility were unable to define the term and those who provided definitions were frequently at odds with the definitions provided by others. Third, interoperability crosses many different dimensions including missions, materiel, and doctrine. It applies to small-scale interfaces between two hardware items and to large-scale issues such as the ability of complex multi-national and multi-service forces to jointly operate on a common battlefield.

The basic concept proposed in this paper is simple. Determining the right content and the boundaries of the portal-based interoperability knowledge-management resource is far more difficult. If the DSPO implements the recommendations presented in this concept paper, it will need to identify, gather, and integrate the interoperability and standardization knowledge elements into a useful portal-based resource. Later in this recommendation, we provide lists of potential customers, programs, documents, and other topics for DSPO to consider in the design of the portal-based interoperability knowledge-management capability.

The IPT received presentations from a number of organizations with interoperability responsibilities. As a result, the members realized how diverse, disconnected, and hard to pin down the interoperability community is. It appears that no organization is taking the lead for overall integration of the community or to provide comprehensive and effective knowledge-management resources to the community. The need for better integration and resources was obvious.

In this section, we also explore a range of interoperability-related topics philosophically, providing ideas for designing an interoperability knowledge-management capability on the DSP portal.

# INTEROPERABILITY DEFINITION AND STRUCTURE

Interoperability is a complex topic with various facets and levels. For this concept paper, we use the broadest definition of interoperability. Because our objective is to create an interoperability knowledge-management resource, we have tried to be inclusive in integrating the entire community into a single knowledge resource.

## General Definition

At a fundamental level, interoperability usually is defined as the "ability of systems to work together." Because systems vary in complexity from simple to complex, the problems of interoperability also cover an enormous range. At the least complex level, a single interface between two systems designed to achieve interoperability is easily understood. For example, midair refueling between the aircraft of two different Services is not possible unless the aircraft are equipped with compatible refueling nozzles and connectors. Allied soldiers fighting side-by-side on the battlefield cannot share their ammunition unless the allies have agreed on a common caliber for ammunition.

The complexity increases dramatically when several allied armies, each with multiple Services, engage in a common mission in a shared battle space. They must be able to communicate and share information quickly and seamlessly. This capability could require thousands of different systems to share common protocols and signals. Achieving compatibility among the many diverse systems involved requires enormous analysis, engineering, and coordination. None is possible without standardization.

The universe of people who need interoperability and standardization information is large and diverse. Likewise, the amount of data that define interoperability and standardization knowledge is broad and deep. An effective knowledge-management resource must structure and organize information so that users can find what they need, when they need it, quickly, easily, and in useful forms. An interoperability knowledge-management capability must enable users to find and link to various knowledge sources related to interoperability including the organization involved, points of contact, requirements documents, programs, and standardization documents. We have identified three major areas of interoperability—information systems, materiel systems, and doctrine.

## Information Systems Interoperability

Information systems interoperability is DoD's highest priority and the focus of interoperability dialogue. Information interoperability includes all the technologies that enable systems and participants related to a mission to exchange data and communicate with each other. Key products influencing information interoperability include software, protocols, signal characteristics, and the equipment needed to create, transmit, receive, process, and display data.

Organizations actively addressing information interoperability include:

1. Assistant Secretary of Defense for Command, Control, Communication and Intelligence

2. Under Secretary of Defense for Acquisition, Technology and Logistics

3. National Security Agency

4. Defense Information Systems Agency

5. OSD Interoperability Office

6. Joint Chiefs of Staff

7. National Imagery and Mapping Agency

8. Joint Forces Command (Joint Interoperability and Integration [JII])

9. Joint Technical Architecture (JTA) Participating Agencies

Key strategic documents that address or identify information interoperability requirements include:

1. Joint Vision 2010

2. Joint Vision 2020

3. DoD Joint Technical Architecture

4. DoD Technical Reference Model

5. CJCSI 3170.01A—Chairman of the Joint Chiefs of Staff Instruction—Requirements Generation System

6. DoD 5000.2-R—Mandatory Procedures for Major Defense Acquisition Programs

7. DoDD 4630.5—Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)

8. DoDI 4630.8–Procedures for Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)

9. CJCSI 6212.01B–Interoperability and Supportability of National Security Systems, and Information Technology Systems

10. CJCSI 3170.01A–Requirements Generation System

Key programs that have major information interoperability influence or content include:

1. Global Positioning System (GPS)

2. JSTARS

3. Global Information Grid (GIG)

4. Global Command and Control System (GCCS)

5. Global Combat Support System (GCSS)

Important standardization documents that help enable information interoperability include:

1. Joint Technical Architecture

2. Technical Reference Model

3. C4ISR Architecture Framework

## Materiel Interoperability

Materiel interoperability focuses on the form, fit, function, and interface ($F^3I$) of materiel items. Materiel interoperability addresses the ability of materiel systems and items to work together efficiently and effectively and involves the compatibility, commonality, and interchangeability of materiel items.

Organizations actively addressing materiel interoperability include:

1. Defense Standardization Program

2. NAVSEA HM&E Equipment Standardization Program

3. Army Horizontal Technology Insertion Program

4. North Atlantic Treaty Organization (NATO)

Key strategic documents that address or identify materiel interoperability requirements include:

1. Joint Vision 2010

2. Joint Vision 2020

3. DoD 5000.2-R

4. Joint Technical Architecture

Key programs that have major materiel interoperability requirements or content include:

1. Joint Strike Fighter

2. NATO Ammunition Standardization Program

Important Standardization documents that help enable materiel interoperability include:

1. Joint Technical Architecture

# Doctrine Interoperability

Doctrine interoperability focuses on the ability of individuals or organization to effectively work together using a common set of rules defined by procedures, practices, or methods. Doctrine interoperability enables participants in a mission to understand how to execute operations based on shared guiding principles.

Organizations actively addressing doctrine interoperability include:

1. AUSCANZUKUS

2. NATO

Key strategic documents that address or identify doctrine interoperability requirements include:

1. Joint Vision 2010

2. Joint Vision 2020

The requirements and opportunities for interoperability and standardization flow not only from the three groupings above but also from organizational affinities and mission requirements. The Defense Standardization Program Office should structure a robust interoperability knowledge-management capability to support networking among the various affinity groupings of organizations and interest that must communicate, deliberate, negotiate, and agree on standardization solutions for interoperability. Two essential affinity-based organizing principles are domains and missions.

# Domain-Centered Interoperability

Domains are large or important areas containing systems, items, or operating characteristics that perform inherently similar functions, use similar types of equipment, or operate in the similar environments. The types of systems, materiel, or interest areas involved define domains. Examples of possible domains include:

*System-Level (Domain) Areas*

1. Land Systems
2. Maritime Systems
3. Aviation Systems
4. Space Systems
5. Command/Control/Communication/Computers/Information Systems
6. Munitions
7. Missiles
8. Nuclear Ordnance
9. Automated Test Equipment
10. Modeling and Simulation Devices
11. Mapping
12. Medical Equipment

*Sustainment Materiel (Domain) Area*s

1. Electrical/Electronic/Electro-optical Components
2. Mechanical Components/Devices
3. Chemical Products
4. Material Products
5. Instruments and Laboratory Equipment
6. Clothing and Textiles
7. Subsistence Items
8. Machinery and Related Equipment
9. Construction Components
10. General Industrial Products

*Special Interest (Domain) Areas*

1. System Engineering
2. Technical Information
3. Facilities Engineering
4. Materials Technology
5. Standardization Program Management
6. Military International Standardization

The domains listed above are composed of organizations, programs, and people that share common themes and interests. The sample domain structure listed above corresponds with the domain structure described in the Infrastructure IPT's set of recommendations concerning the Defense Standardization Program Structure. We need not be limited to categorizing interoperability opportunities into a single domain structure. For example, the JTA has its own hierarchical domain structure. We should be able to classify interoperability opportunities using the above domain structure, the JTA domain structure, and any other classifications that customers may use. The same interoperability opportunity or requirement

may be classified in multiple domains and presented to the user in the domain structure most familiar to them.

Within each domain are requirements and opportunities for interoperability and standardization. For example, within the aviation domain all aircraft pilots must be able to communicate to interoperate. All aircraft must be capable of navigating using GPS signal data to rendezvous accurately. All aircraft must have compatible airborne refueling equipment to be supported by a common refueling aircraft.

Decision makers across each domain must communicate and negotiate to arrive at common mutually satisfactory solutions to their shared problems and opportunities. Common enterprise forums, a concept addressed in another Infrastructure IPT set of recommendations, could provide an excellent forum for discussion of domain-based interoperability requirements and identification of domain standardization opportunities. The JTA is also a good example of structuring interoperability requirements into domains. The Infrastructure IPT also has recommended a knowledge-management portal for standardization in a separate set of recommendations. That same portal can provide the essential resources to facilitate, support and document the work of Standardization Area Support Teams (SAST), customer functional boards, enterprise forums and the interoperability community. Interoperability and domain content in the portal might address information, materiel, and doctrine interoperability.

Interoperability requirements and standardization opportunities exist across each domain within the individual Services, jointly across the Services and Agencies, and between U.S. Forces and allied partners. Within functional area-based discussion forums, dialogue might focus on acquisition issues; materiel interoperability and standardization opportunities will be a focus within the dialogue.

## Mission-Centered Interoperability

The operations community defines mission-centered interoperability requirements. Missions frequently involve assets from many different domains. Examples of possible mission areas include:

1. Joint Operations
2. Air Operations
   2.1. Tactical Operations
   2.2. Air Transport
   2.3. Movement and Documentation
   2.4. Helicopter
   2.5. Search and Rescue
   2.6. Flight Safety
   2.7. Mishap Investigation
3. Land Operations
   3.1. Tactical Doctrine and Operations Procedures
   3.2. Movement and Transportation

    3.3. Logistics
    3.4. Artillery
    3.5. Battlefield Maintenance
    3.6. Combat Engineer
   4. Naval Operations
    4.1. Amphibious Warfare
    4.2. Maritime Tactical
    4.3. Radiation Hazards
    4.4. Helicopter Operations from Ships (Non-Carrier)
    4.5. Military Oceanography
    4.6. NATO Shipping
    4.7. Replenishment at Sea
    4.8. Submarine Escape and Rescue
    4.9. Mine Warfare
    4.10. Diving Operations
    4.11. Maritime MISC.
   5. Electronic Warfare
   6. Combined Combat Arms

The missions that use assets from multiple domains determine the scope of inter-operability requirements, the related standardization opportunities, and the types of forums needed to support the dialogue. Mission-based discussion forums may come and go as mission requirements dictate, while domain-based discussion fo-rums are relatively permanent.

Often diverse assets must interoperate to perform missions effectively. In mis-sion-centered forums, issues of information and doctrine interoperability might predominate. Deliberations about materiel interoperability or materiel standardi-zation opportunities might place a distant third. Still, when the opportunities arise in the mission-based dialogue, the acquisition community must translate the re-quirements into materiel solutions.

The mission-centered interoperability forums are essential elements in the total interoperability requirements determination system. The proposed interoperability and standardization portal must include these operations-focused bodies and their requirements.

# Interoperability Knowledge-Management Portal Content and Features

Content and features will determine the value of the interoperability knowledge-management portal. In this section, we provide a number of different ideas for adding content and value to the interoperability knowledge-management resource.

## IDENTIFY AND DOCUMENT THE INTEROPERABILITY CUSTOMER SET

Interoperability depends on standardization. Every organization, program, and person with an interest in interoperability by extension has an interest in standardization. One reason to have interoperability and standardization together on the same portal is to show clearly the connection and educate the interoperability community about the importance of standardization in achieving their objectives.

The DSPO should make the directory a reflection of the interoperability community and seek to establish partnerships with key offices in the interoperability community who can manage the databases, provide content for the directory, or provide resources to fund content maintenance.

The table below identifies some interoperability customers within various focus areas. Links to these and other customers would be provided on the portal. The customer list would be under continual refinement as new customers are added or existing customers disappear.

| Focus Area | Customers/Organizations/Programs |
|---|---|
| Mission Interoperability Requirements Determination (Operations) | ♦ JCS<br>♦ CINCS |
| Interoperability Policy | ♦ OSD Interoperability Office<br>♦ Service Interoperability Offices<br>♦ JTA |
| Land Systems | |
| Maritime Systems | |
| Aviation Systems | ♦ F-22<br>♦ JSF<br>♦ C-17 |
| Space Systems | |
| C4I Systems | |
| Munitions | |
| Missiles | |
| Nuclear Ordnance | |
| Automated Test Equipment | |
| Modeling and Simulation Devices | |
| Mapping | |
| Medical Equipment | |
| Electrical/Electronic/Electro-optical Components | |
| Mechanical Components/Devices | |
| Chemical Products | Joint Service Aircraft Fuels IPTs (Ad-hoc) |
| Material Products | |
| Instruments and Laboratory Equipment | |
| Clothing and Textiles | |
| Subsistence Items | |
| Machinery and Related Equipment | |
| Construction Components | |
| General Industrial Products | |
| System Engineering | |
| Technical Information | |
| Facilities Engineering | Customers: CINCLANTFLT, CINCPACFLT, NAVSEA, CNET, NAVEUR, CNO, NAVAIR, RESFOR and USMC<br>Organizations: NAVFAC<br>Programs: MCON, ERN, FHN and BRAC |
| Materials Technology | |
| Standardization Program Management | |
| Military International Standardization | NATO, TTCP, ABCA, AUSCANZUKUS |

# CREATE AN INTEROPERABILITY ROADMAP

Organizations with interoperability requirements are the leading edge of standardization activity within the DoD. The DSP must be a key player where interoperability is a priority. DSP personnel need to be actively involved with the organizations working on interoperability issues. One way to help the standardization workforce engage more with the interoperability community is to provide them with a clear roadmap to the community.

Part of the roadmap is taxonomy for interoperability. There is no orderly classification system for listing various areas and elements of the interoperability universe. The proposed taxonomy-based roadmap will serve as a guide to the interoperability community and help define the areas of opportunity. The roadmap will help form more effective networks for interoperability across the customer base.

# CREATE A "WHO'S WHO IN INTEROPERABILITY"

DSPO should use the roadmap to create a directory of who's who in interoperability. It should list as many DoD, defense industry, and international organization, programs, and projects with interoperability credentials as possible. The roadmap should group the listed organizations into useful categories and so directory users can sort and query by category. A single listed organization might surface in several different queries such as Service, domain, joint programs, or technology area. Where available, each listed organization should have associated useful information such as key points of contact, Web addresses, mission, and activity status. Where feasible, DSPO should arrange with the listed organizations for them to maintain their associated data.

# HELP BUILD INTEROPERABILITY NETWORKS

The common enterprise forums, advocated by the Infrastructure IPT, are examples of how it might be possible to build interoperability networks across a domain. The portal should provide capabilities and features that will encourage and enable network formation. Various types of network facilitation tools are possible, ranging from general topic-oriented threaded discussion spaces to dedicated SAST, customer functional board, or team areas.

Examples of key interoperability networks and their members might include:

υ   C4I—JTA members, C4I-related program managers, chief engineers, and acquisition managers

υ   Aviation—JACG members, aviation program managers, aviation-related chief engineers

# IDENTIFY AND PROMOTE ACTION ON INTEROPERABILITY AND STANDARDIZATION OPPORTUNITIES

The interoperability knowledge-management portal must have resources that solicit, identify, and promulgate interoperability and standardization opportunities. Examples of interoperability-standardization opportunities include:

- υ Use of common air-to-air refueling interface hardware across all services and allied forces, and

- υ Identification of critical physical and functional attributes for aviation fuels in aircraft engines.

DSPO should encourage users to suggest opportunities and maintain a list of suggested opportunities on the portal with potential players identified. DSPO should explore the potential opportunities and post the findings or results. DSPO should identify responsibilities for evaluating opportunities based on the nature of the opportunity. For example, a SAST, customer functional board, or enterprise forum might be best qualified to evaluate a situation.

# IDENTIFY, LIST, AND INTERPRET INTEROPERABILITY POLICY AND DIRECTIVES

DSPO should seek out and identify policies and directives that address or require interoperability. A searchable reference database for these documents should be created and information or links that will aid users in obtaining these guidance documents provided. Examples of interoperability policy and guidance documents were listed in a previous section.

# DEFINE AND COMMUNICATE INTEROPERABILITY REQUIREMENTS

DSPO should seek out and identify documented interoperability requirements. These requirements may exist in public law, ISAs, interservice agreements, weapon systems contracts, and various other documents. DSPO should create a searchable reference database for these documents and provide information or links that will aid users in obtaining the documents. One example of an interoperability requirements document is a public law, the Information Technology Management Reform Act (Clinger/Cohen Act).

# IDENTIFY AND PROVIDE MATERIEL STANDARDS DOCUMENTS THAT PLAY A ROLE IN JOINT INTEROPERABILITY

DSPO should seek out and identify materiel standards documents that play a role in joint interoperability. The documents may be the implementing documents for an interservice agreement, JTA required standards, NAVSEA HM&E equipment that enable ships to interoperate, or others. A searchable reference database for these materiel standards and documents should be created and information or links that will aid users in obtaining the documents provided. Examples of joint materiel standards documents include:

- υ MIL-STD-1760–Aircraft Store Electrical Interconnection System, and

- υ MIL-STD-464–Electromagnetic Environmental Effects Requirements for Systems

# IDENTIFY AND PROVIDE MATERIEL STANDARDS DOCUMENTS THAT PLAY A ROLE IN INTERNATIONAL INTEROPERABILITY

DSPO should seek out and identify materiel standards documents that play a role in international interoperability. The documents may be the implementing documents for ISAs, NATO-required hardware, aviation refueling equipment that enable aircraft of different nations to refuel from a common source, or others. A searchable reference database for these materiel standards documents should be created and information or links that will aid users in obtaining the documents provided.

# IDENTIFY AND PROMOTE METRICS FOR MEASURING INTEROPERABILITY

DSPO should seek out and identify metrics that are used or could be used to measure or demonstrate interoperability. The metrics could be quantitative or qualitative. DSPO could use the metrics in milestone reviews, program assessments, or documents defining interoperability requirements. A searchable reference database for these metrics should be created and information or links that will aid users in understanding and using the metrics provided. DSPO should provide data that illustrates interoperability performance as reported using the metrics. Examples of interoperability metrics include:

υ   Operational Views (OVs), System Views (SVs), and Technical Views (TVs)

# IDENTIFY INTEROPERABILITY AND STANDARDIZATION BEST PRACTICES

DSPO should seek out and identify interoperability and standardization best practices that demonstrate how to achieve interoperability quickly, easily, or at lower cost. The best practices could be management, engineering, logistics, or operational practices. The best practices might be reinforced using case studies, reward, and recognition. A searchable reference database for best practices and provide information or links that will aid users in understanding the best practices and in contacting those who have used the best practices should be created.

# IDENTIFY AND DOCUMENT INTEROPERABILITY ACHIEVEMENTS, SUCCESS STORIES, AND CASE STUDIES

DSPO should seek out and identify exceptional interoperability achievements and success stories and develop case studies that document and demonstrate how the best programs achieved interoperability successes. The case studies could document processes, management techniques, engineering solutions, logistics impacts, or cost savings. A searchable reference database for achievements, case studies, and success stories and provide information or links that will aid users contacting those who involved in the documented achievements should be created.

# ANSWER FREQUENTLY ASKED QUESTIONS ABOUT INTEROPERABILITY

DSPO should identify frequently asked questions (FAQs) regarding interoperability. Determine and document the answers to the questions. A searchable reference database for frequently asked questions should be created and examples or links to programs or people who have deeper knowledge regarding the topic of the questions provided. Examples of frequently asked questions include:

υ   Where would I go to find information on interoperability standards for the (select domain)?

υ   How can standardization products and services help improve interoperability?

# PROVIDE OR LINK TO INTEROPERABILITY FORUMS

DSPO should seek out, identify, or create forums for dialogue about interoperability and develop forums on the portal that will help people in the interoperability and standardization communities work together. DSPO should identify people in the interoperability community who can participate in or help facilitate on-line interoperability forums. A searchable reference database for interoperability forums should be created and information or links to the forums provided.

# COLLECT AND REPORT INTEROPERABILITY NEWS

DSPO should seek out news, current events, what is new, or similar information features about the interoperability community and make the interoperability news available through the portal in an on-line newsletter or similar feature. DSPO should identify people in the interoperability community to serve as sources or conduits of interoperability news and identify key interoperability offices that might provide routine content for the portal or who might maintain selected interoperability features on the portal. DSPO should identify offices that would use the portal to host information about their organizations. A searchable reference database for interoperability news should be created and information or links to other sources of interoperability news provided.

# PROMOTE ACTION ON INTEROPERABILITY ISSUES

The interoperability knowledge-management portal must have resources that solicit, identify, and promote action to resolve interoperability and standardization issues.

DSPO should encourage users to address interoperability issues and maintain a list of known issues on the portal with identified community areas affected by the issue. DSPO should explore the issues, determine the impacts, and post the findings or results. DSPO should identify domains or other entities that need to be involved in finding solutions to issues. For example, a SAST, customer functional board, or enterprise forum might be best qualified to offer solutions in a given situation.

# IDENTIFY, PROVIDE, OR LINK TO INTEROPERABILITY-RELATED EDUCATION AND TRAINING

DSPO should seek out and identify education and training resources related to interoperability. The training resource may be courses, books, articles, films, or a variety of other media. A searchable reference database for these education materials should be created and information or links that will aid users in obtaining the training or documents provided.

# EDUCATE THE INTEROPERABILITY AND STANDARDIZATION COMMUNITIES ABOUT ACHIEVING INTEROPERABILITY THROUGH STANDARDIZATION

Seek out and identify resources that specifically relate standardization to interoperability. The resource may be stories, cases, training courses, books, articles or a variety of other media. Create a searchable reference database for these resources and provide information or links that will aid users in obtaining additional information.

# RECOGNIZE AND REWARD LEADERSHIP FOR INTEROPERABILITY RESULTS

DSPO should seek out and identify key individuals in the interoperability community who are pace setters, opinion leaders, advocates, promoters, or most successful leaders. The people might come from management, engineering, logistics, standardization, or operational practices. DSPO should reinforce leadership behaviors using case studies, reward, and recognition. A searchable reference database for reward and recognition should be created and information or links that will aid users in the recognized leaders provided. Examples of potential rewards and recognition include:

υ   Annual Defense Standardization Program awards, and

υ   Recognition through published articles, case studies and best practices.

# LINK IMPLEMENTATION WITH THE STANDARDIZATION PORTAL DEVELOPMENT STRATEGY

The interoperability content and features are contained in the DSP portal. While the interoperability portion should appear to stand alone as a clear and significant attractor for the people in the interoperability community, fully integrate the interoperability content into the overall DSP portal structure. DSPO should implement the interoperability component following and leverage on the portal's standardization content and features.

Those who design and develop the portal must be fully cognizant of the parallel structure and functionality for standardization, interoperability, and logistics readiness so that they can create simultaneous capabilities and capacities to host all three subjects as appropriate in the most cost effective manner.

DSPO should use the implementation plan for the portal deliverable for interoperability and logistics readiness capabilities as well and seek partnerships in the interoperability and logistics readiness communities to participate in and support the portal development effort.